



Terre Haute South, Sullivan high schools compete in Super Mileage Challenge

By Howard Greninger
The Tribune-Star

TERRE HAUTE April 28, 2009 12:13 am

— Sweat glistened from the neck of Drew Morley as he pulled off his helmet, allowing a strong wind to cool him down.

Morley, a 17-year-old junior at Terre Haute South Vigo High School, had just completed a run Monday at O'Reilly Raceway Park in Indianapolis in a lightweight car he and fellow classmates designed and built. "It was really hot in there and it is hard to see sometimes," said the 5-foot-11 Morley, who barely fit in the 96-inch car. "You don't know when people are passing you. You just have to pay attention a lot and try to keep going and try to stay focused. The motor gets real hot and you can feel the heat coming through the firewall." Terre Haute South and Sullivan High School were among 40 Indiana high schools that entered 60 cars in the 14th annual Indiana Mathematics, Science and Technology Education Alliance (IMSTEA) Super Mileage Challenge.

Three classes of competition require drivers to travel around the paved raceway track 10 times, or 6.25 miles. One 6.25-mile trip equals one set. Teams must complete three sets to be ranked in the competition, but each team gets 10 sets to try for the best mileage. A set takes about 25 minutes to drive.

Drivers must weigh at least 150 pounds and cars cannot exceed 25 mph. Cars also must average at least 15 mph around the track.

The stock class uses a standard 3.5-horsepower engine without modifications. Monday, the class drew 28 cars and was won by Greenfield Central High School, which got 1,048.79 miles per gallon.

The unlimited class allows engine modifications and had 27 entries in this year's competition. Mater Dei High School bested the field with 1,293.09 mpg.

A new category this year was the experimental class, which was entered by five cars using diesel fuel, batteries and hydrogen.

Sullivan High School finished in ninth place in the stock class. It is only the second year of competition for the school. "We're pretty pleased," said Sullivan teacher Brandon Small. "We averaged 309 miles per gallon for the best three of our runs. We made five runs, but our best runs were 315, 314 and 300 miles per gallon." The stock and unlimited cars' gas tank is actually a brake fluid container, holding about a pint of gasoline. Sullivan's team measured theirs a bit more precisely. "We have 350 to 400 grams of fuel," said student Skyler Thacker.

Sullivan's first run was by freshman driver Matt Migliorini. As he sped away, Cole Chickadaunce and Thacker, both 16-year-old sophomores, said they just wanted to beat last year's performance. Chickadaunce said last year's team had just one gear.

"It was like being in third gear on a bike. It took a lot of fuel to get it going, and once it was going it was OK, but that hurt on fuel," Chickadaunce said.

This year, the team had 10 gears, Small said.

Sullivan's first run was 300 miles, the second was 271, as the wind picked up velocity.

"We get up to about 24 mph and then coast down to 5 or 6 mph before the driver starts up the motor. He has a pull string over his shoulder," Chickadaunce said.

"Walmart donated a \$200 GPS [global positioning system] to us so we can keep an eye on our average times, current speed and the current time. We use cell phones to communicate," Thacker added.

The Sullivan car has a wood chassis covered with fiberglass and uses heat-shrunk clear plastic film. The car

weighs about 250 pounds without a driver.

“We are close to 400 pounds and we want to bring that down to about 275 pounds next year,” said Small.

“We probably will use a different chassis, get rid of the wood chassis and use aluminum. They were already talking about next year on the way up here.”

Terre Haute South’s Morley gave some quick instructions on where to throttle the car just before Evan Myers, 17, also a junior at South, sat in the car, hoping to take a turn at driving. Morley averaged 364 miles per gallon in the only run made by the car before mechanical problems eliminated the Terre Haute team.

“We had good bearings, but when they welded on the disc brake, it actually melted our bearings and we had to replace them with whatever we had, which wasn’t as good,” said South senior Paul Bennett, 18, who is in his third year of the competition.

“Since that is off, it throws the axle off, which will pop the chain off. So we have been having a lot of problems with the chain,” Bennett said, during the competition.

Last year, the school made just four laps before engine problems dumped the team from competition.

“We only got one run in because the chassis bearing didn’t hold up, but we did better than last year,” said South teacher Steve Joseph. South has participated 13 of the 14 years the gas mileage competition has been held.

Joseph said students design and build a new car each year, providing them with the best learning tool: problem solving.

“The kids get experience, they have learned a lot working together, and the teamwork and communication is crucial. It is a good learning experience. We can’t expect these guys to be perfect every time. They try some things. It is hard as a teacher to keep your mouth shut, but you keep your mouth shut and let them learn and let those team captains do their job,” Joseph said.

“Whether you get 100 laps in or three laps in, it is still an experience they will never get anywhere else in their education,” Joseph said.

To be eligible to compete, each school must submit a detailed technical proposal covering all aspects of the design and construction of a car. Such things as aerodynamic drag, friction forces, braking forces and cornering forces must be calculated and described in detail. The proposal ensures that students are exposed to the scientific principles of high mileage as well as the technology of building the car.

Both South and Sullivan students used computer aided design software to make their cars, then began building and testing the cars. Students have worked on the cars since August.

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